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ABSTRACT

In the last several years, one of the approaches that has been advocated as a mechanism to bring about needed improvements and revitalize education is the use of incentives. This paper suggests a conceptual framework for studying the uses of incentives in American public education and examines briefly the state-of-the-art of recent research and practice incentives. The primary focus of the paper is on incentives as they relate to the organization and governance of education in the public school systems. Several incentive programs are examined on the basis of three important characteristics: the reward offered, the individuals or organizations that may receive the reward, and program goals and/or results required to obtain the reward. Following consideration of these programs, a basic concept underlying all incentive programs is formulated. A conceptual framework is then proposed that has three main variables: (1) program targets, (2) goals/results, and (3) reward. Conclusions and recommendations are based not only on the material presented in this paper, but also on the literature reviewed. A 40-item bibliography is included. (Author/JF)

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A CONCEPTUAL FRAMEWORK FOR THE STUDY OF INCENTIVES IN AMERICAN PUBLIC EDUCATION

by

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A CONCEPTUAL FRAMEWORK FOR THE STUDY OF INCENTIVES IN AMERICAN PUBLIC EDUCATION

I. INTRODUCTION

A. Purposes and Limitations

In the last several years one of the approaches that has been advocated as a mechanism to bring about needed improvements and revitalize education is the use of incentives. Incentives, it has been argued, may be an essential ingredient in upgrading teaching techniques or in improving student performance. A wide variety of experimental and operational incentive programs has been tried and still others proposed.

The purpose of this paper are to suggest a conceptual framework for studying the uses of incentives in American public education and to examine briefly the state-of-the-art of recent research and practice on incentives. Review of the literature has been confined largely, although not exclusively, to the last 5 years. It is not, however, the purpose of this paper to present, per se, a review of the literature, but rather to use available information in developing concepts and providing illustrations.

The primary focus of this paper is on incentives as they relate to the organization and governance of education in the public school systems of the United States. Consequently, the extensive literature dealing with incentives as used in classroom learning studies and experiments is only treated peripherally.

B. Approach

In this paper the term "incentive program" is used to refer to a plan or program which by self-definition uses incentives as specific components of the program or, in some cases, meets one or more of the meanings of incentives included in the definitions found in Appendix A.

Several incentive programs are examined on the basis of three important characteristics: the reward offered, the individuals or organizations that may receive the reward, and program goals and/or results required to obtain the reward. Following consideration of these programs, a basic concept underlying all incentive programs is formulated. A conceptual framework is then proposed. The framework has three main variables: (1) program targets, (2) goals/results, and (3) reward.

Conclusions and recommendations are based not only on the material presented in this paper, but also on the literature reviewed as a part of the study which is then presented.

Appendix A to the paper contains definitions of incentive as used in several of the social science disciplines. Appendix B presents descriptions of several incentive programs in American education; the descriptions were derived from the literature.

II. CONSIDERATIONS IN THE DEVELOPMENT OF A CONCEPTUAL FRAMEWORK

A wide variety of proposed, experimental, and operational programs in public education have been labeled as incentive programs. These applications have ranged from performance contracting (called incentive contracts by some, e.g., Stucker and Hall (38)) to merit pay for teachers and including the use of incentives in the classroom for students to enhance learning, the latter sometimes in conjunction with bonuses for teachers and parents. Appendix B of this report describes seven examples of programs which use incentives as a basic component. These examples are neither representative nor exhaustive. They were chosen to illustrate not only the wide variety of incentive programs but also some of the ideas advanced in this paper.

Considering the wide variety of incentive programs, it seems reasonable to ask whether there are any common characteristics or components of the programs which may be abstracted to serve as the basis of a conceptual framework. This section addresses this question.

It is the position taken in this paper that incentive programs have three aspects which may be abstracted to serve as a basis for developing a conceptual framework. These three aspects are:

(1) A reward is offered.

(2) There are goals or results to be obtained.

(3) Individuals or organizations may obtain the reward by achieving the goals or results.

In this section several incentive programs will be examined from the three points of view indicated by these aspects.

A. Targets of Incentive Programs

The targets of incentive programs are the entities which may receive the reward. Thus, in a program in which teachers are to be paid a bonus dependent on student learning, the teachers are the target, even though the students benefit as a result of better learning. Incentive programs may have provision for either individuals or organizations as targets. The incentive programs which have received the most attention are those which have been directed toward individuals; that is, personnel in the school system.

Coleman, for example, has noted that incentives in education are "...merely a special case of the general point that any organization is a system of interdependent incentives, and the functioning of the organization depends upon the adjustment of these incentives." (7, p. 1) He goes on to say that incentives may be adjusted for:

(1) The School Superintendent

(2) Staff members in the Administrative Office

(3) Principals

(4) Teachers

(5) Children

(6) Parents.

Jung, Lipe, and Wolfe identify the same general target groups (21, p. 20) and go on to point out that incentives may be provided to these target populations either individually or as groups (e.g., all or none of the teachers in a particular department, school, or district). Obviously, incentive programs may be directed at various combinations of these target groups.

Programs which have had various categories and combinations of individuals as targets have included: many experimental programs which used incentives to improve academic performance; two major programs - one testing of OEO and one by USOE - of large scale incentives in education; programs that have attempted to introduce merit pay for teachers using academic performance by students as the basis of the reward; as well as a number of operational merit pay plans, most of which do not use student achievement tests as measures. Most of the experimental programs have had students as the targets. Lipe and Jung (23) provide a review of the literature in this area which is substantially the same as that provided by Jung, Lipe, and Wolfe. (21) The latter also review in some detail eight student incentive programs. (21, Appendix A)

Some experimental programs either focused on the teacher or included the teacher and sometimes the parent as a part of a more inclusive design. Fox and Jung (12), for example, report a study which combined student, teacher, and some parent incentive in a brief experiment. They suggest that the results, although quite tentative, generally support the notion that incentives tend to enhance school learning. The nature of design, including the three types of incentive, does not yield information on which category of incentive may be most effective.

OEO, as a part of the large-scale study relative to performance contracting, included an effort (29) to test the effects of "incentive only." This program involved contracting with local school districts, which in turn contracted with the local teacher association to provide incentives to students and teachers. The OEO report includes results that indicate the use of incentives did not seem to contribute to academic (math and reading) improvement on the part of the students.

During the school year 1971-72 the U. S. Office of Education designed and implemented a 1-year project on the use of incentives in education. The experiment involved four school districts. In each district there were experimental and control schools. Two of the districts had "incentives to teachers only" programs, and two of the districts had "incentives to teachers and parents programs.

Planar Corp. (31) in its impact evaluation report generally concluded that the teacher only model did not demonstrate any differentially positive effects over the control school in improving student performance. On the other hand, the teacher/parent model did seem to have such effects. The report notes, however, that two features of the design impose severe limitations on the inferences which may be drawn from the study. (31, IV - 768) These design features are the lack of randomization in assignment of treatments to units and the small number of experimental units (i.e., only two per condition).

The OEO performance contracting study, of which the incentives only experiment mentioned above was a part, has also been criticized for lack of randomization in key features of the design. (28)

Merit pay programs have raised considerable controversy, usually because they have emphasized student academic achievement as the basis of the reward.

Thomas and McKinney, who treat incentive or merit pay plans as one of several possible programs that are part of the accountability movement, point out that:

> The incentive pay plans advocated today seek to replace or supplement a salary schedule based on education and longevity with a plan that provides rewards to teachers commensurate with performance. (43, p. 40)

The usual incentive is a salary differential generally awarded for superior performance in the standard teacher role. In this context superior performance is intended to be determined by measures of student achievement or perhaps classroom observation.

The most important variation in merit or incentive pay plans according to Thomas and McKinney is differentiated staffing.

Differentiated staffing generally provides not only for differential roles for teachers but also for differential pay according to the role. (48) Within any one role, however, there is usually not a salary differential based on student achievement, which is, as noted above, supposed to be a prime factor of merit pay plans.

An article in Nations Schools (49) discusses briefly four merit pay plans including the so-called Clark plan for Washington, D. C., which proposed a four-level hierarchical staff of teachers with promotion from one level to the next higher level dependent in large part on student advancement in math and reading as measured by standardized achievement tests. This plan was opposed, it would appear successfully, by the teachers' union.

Rhodes and Kaplan (32) include dexcriptions of 11 merit pay plans, none of which seems to have as a feature the measurement of student achievement as a prime or even partial indicator for determining reward.

One salary plan for teachers described by Chaplin (5) as a merit plan seems to be essentially a salary schedule of the more traditional preparation-longevity type. Although targets for incentive programs may include a number of personnel in the educational system, when the experimental classroom studies are excluded, almost without exception the target has been teachers.

Two exceptions to this may be noted. Lake County, Florida has a plan which as described in "Outlook for Teacher Incentives" (49) uses a salary schedule based on training, experience, and school size plus a bonus of $980.00 for principals. The bonus is conditional upon undertaking and completing an approved project. The other exception is the differentiated staffing plan being implemented in Temple City, California which redefines the traditional principal's role, eliminating the usual administrative details and emphasizing skills in group dynamics and social leadership. (37)

For incentive programs which have had personnel as targets, by far the greatest number has been directed at students. These are not, however, germane to this paper. Of the balance, the bulk of the programs have had teachers as the targets. In some experimental programs teachers, in combination with students and/or parents, have been the targets. In some of these experimental programs the reward has been given to all (e.g., all students in the classroom) only when the group achieved some minimum or average level of performance; otherwise, no one received the reward. In all cases, however, the net effect has been that an individual benefited.

All of the foregoing programs have, therefore, had one or more sets of individuals as the target. Another whole class of programs includes those directed at an organizational entity - schools or school districts, for example. One type of program aimed at school districts is intended to alter the form of organization itself. During the last half century one of the prime movements in American public education has been the movement toward more and larger comprehensively-organized school districts, which offer K-12 or 1-12 grades under a central administration. In California such comprehensively organized districts are called unified districts. The State of

California, as provided for in the California Education Code of 1959 as amended through 1972 (45), intends to have unified districts as the primary form of school district organization. To encourage the formation of such districts, additional monies over and above the basic state aid are offered to unified districts that meet certain conditions. This aid is (based on the 1969 level of support) about 2.6 percent and 2.1 percent of the basic aid for elementary and secondary school pupils, respectively.

Two of the reasons that have often been advanced for consolidating school districts are: (1) better educational, more diversified programs and (2) savings, for example, through elimination of duplicate facilities. One approach has been suggested to address directly the question of savings as a result of proper organization.

Cohn and Millman (6, p. 88) state that "considerable evidence demonstrating the existence of substantial scale economies in public (especially secondary) schools has been presented in recent years ...." They suggest that proper size of school districts may result in economies of scale, and they propose an approach. Unlike the California program, which is concerned with the form of school organization, Cohn and Millman are concerned with the question of size of the organization.

Another group of incentive programs which are aimed at the organizational level is not intended to change the organization per se, but rather hope to alter the structure or operation of education.

Johns (20) proposed to modify the Florida State Aid Program, a foundation program, by providing a portion of state monies by comparing the ratio of: (1) local (district) actual effort to support education in relation to the local effort required for a minimum program with (2) state average ratio of actual effort to minimum effort. This proposal to affect distribution of state aid monies differs from the Cohn and Millman proposal.

The latter were directly concerned with affecting organization, whereas here the concern is with structure; that is, the mechanism or operation of local (district) support of education.

Johns makes clear that an incentive program such as he proposes must be developed in the context of a particular state and its aid program and mentions that New York, Rhode Island, and Wisconsin have incentive programs.

Some incentive programs have had as an objective the changing of the structure or operation within the educational system. One example of this type of program is Title I of the Elementary and Secondary Education Act, which provides Federal assistance to local education agencies to improve educational programs for children of low-income families"...to meet the special educational needs of educationally deprived children." (9) The incentive portion of this program is in Part B, which provides for an incentive grant for qualified states that apply. Qualified states are those whose index of effort (the ratio of all non-Federal monies spent on education to total personal income) exceeds the national index (average of all states).

In summary, incentive programs may have as targets either individuals or organization entities. Incentive programs which have individuals as targets may be further described by the classes of personnel who are the targets within the school system. Incentive programs aimed at the organizational level, in contract, may be further subdivided by the nature of the change that is sought: changes, on the one hand, to the organizational arrangement or changes, on the other hand, to the structure or operation.

B. Goals/Results of Incentive Programs

Three characteristics of incentive programs were identified and need to be examined in developing a conceptual framework. These characteristics are the:

(1) Entities that may obtain the reward (as discussed above, the targets)

(2) Results to be obtained

(3) Notion of a reward.

The purpose of this section is to discuss the second of these characteristics.

One analytic technique for examining education is to view education as a system which has certain inputs, uses certain processes, and produces certain outputs. Thomas and McKinney (43), for example, in discussing the testing and evaluation issue in the "accountability movement," use this approach to distinguish the three parts of the system that may be evaluated; these are: (1) inputs (e.g., funding), (2) processes (e.g., teacher performance), and (3) outputs (e.g., student learning). This system's analytic approach will be used to examine the goals/results aspect of incentive programs.

The notion that the reward will be obtained when the results are achieved implies three additional ideas. First, that goals and results are consistent; that is, if the program goal is to alter an input, then the results (the conditions to be achieved to obtain the reward) will also be at the input level. Second, a procedure exists (method, process, technique) by which the results may be obtained. Third, there is a method for ascertaining whether the results have been achieved; that is, there is a method of measurement. Thus, the goals/results aspect of incentive programs may be examined

from three points: (1) goals/results consistency, (2) procedures to be employed, and (3) the measurement method.

1. Output Domain

Those incentive programs which use standardized achievement tests to measure, for example, student gains in reading and/or math are obviously dealing with results in the output domain. The USOE incentive project evaluated by Planar Corp. (31) and Blaschke (1) was of this type. This program had as a goal the demonstration of the feasibility of offering incentives to improve school learning, which is clearly in the output domain. The specific results were also in the output domain. Bonuses were to be paid to teachers only or to teachers and parents (the two incentive models) depending on the extent to which students showed improvement in fractional grade equivalencies (GE) over a basic gain indicator (BGI) for reading and math separately. The following table shows the required results and the associated payment:

Improvement	Teachers	Parents
Less than BGI	None	None
BGI	$150	$12.50
BGI + .1 GE	300	25.00
BGI + .2 GE	450	37.50
BGI + .3 GE	600	50.00

The instrument used to measure student gain was the Metropolitan Achievement Test Batteries, with average (mean) class improvement used to determine the amount of payment.

In this program the methods to be used by the teachers to improve student learning were not specified. Teachers in the experimental schools were free to select those methods or combinations of methods which they thought would best produce the desired result. It must nevertheless be

taken as a given that it was a basic assumption of this program that such methods do in fact exist, and that such method (s) were probably different than those used in the control schools.

The OEO study of performance contracting was similar, in the respects discussed above, to the USOE program. The OEO study: (1) had as a goal the improvement of student learning (output), (2) specified output results for which rewards would be paid, (3) used standardized achievement tests as the measurement method, and (4) left the choice of method up to the contractors or, in the case of the incentives only portion of the study, to the teachers. This exclusion of methodology as an explicit consideration in the OEO study has been criticized by Miller (28) as a serious omission. It has been argued on the other hand, however, that if contractors (or teachers) are to be accountable (or paid) on the basis of output, then it is improper to control the methods that may be used to obtain the results. (40)

2. Input Domain

In contrast to the foregoing examples which dealt with educational system outputs are those incentive programs which have as a general goal the alteration of an input characteristic. Those programs cited earlier as having organizational entities as the target have the change of an input characteristic as the goal. The State of California program (45) to achieve unified school districts as the basic form of school organization is of this type (assuming, of course, that one is willing to define the form of school organization as being in the input domain). In this case the result and the goal are identical; that is, the reward is obtained only by unified school districts meeting certain conditions. The measurement method is essentially an administrative process determined in part by the provisions of the California

Education Code and in part by rules and regulations of the State Board of Education, and carried out by the Superintendent of Public Instruction. In this case the method by which unified districts are to be achieved is a political procedure and is spelled out in the code. (45, Division 5, Chapters 1-10)

Cohn and Millman who propose an approach to obtain economies of scale also expect to affect school organization. They state: "An explicit incentive structure in the state aid process would not only provide a certain degree of stimulus to change but would also serve to focus attention on the scale issue." (6, p. 89) The Cohn and Millman approach differs from the California program in four important ways. First, it is a proposed rather than an operational program. Second, it is limited to the secondary school level. Third, it is the size of the organization rather than its form that is of concern. Fourth, it requires the assumption that a proper or optimum-sized school (or district) may be determined. In discussing this last issue they (6) note that "...most of the studies indicate a U-shaped relationship between per pupil cost and school size, measured by enrollment. It follows that most schools are either too large or too small...." (p. 89) Their report goes on to note, however, that there is some indication that U-shaped relationships may not be accurate and that it is possible that costs might decrease indefinitely as school size increases. (p. 91) Nevertheless, they assume the U-shaped relationship in proposing a program of promoting economies of scale.

Cohn and Millman propose, for example, that as districts deviate from the optimum size they be penalized an appropriate amount of their state aid monies, and the greater the deviation, the greater the penalty. In this example the purpose of the proposal may be taken as "to obtain optimum-sized school districts" and the results as "the closer to

optimum, the smaller the penalty." Thus, both the goal and the results are in the input domain.

The measurement method required for this program, while technically complex to establish, is relatively simple to operate once in place. It involves the determination of an optimal sized school (district), the unit cost of such a district, the unit costs for each district in the state, a legislatively-established scale factor, and the use of enrollment data (ADA) to compute the appropriate penalty factors and the loss of state aid monies. Cohn and Millman do not specify procedures by which schools or districts could reduce their deviation from optimum size, although in most cases it is likely that political procedures would be required.

Johns' proposal (20) like Cohn and Millman also deals with the distribution of state aid monies. Unlike Cohn and Millman, however, Johns is not concerned with the organizational question but rather with structure, in this case with the mechanisms by which the amount of local support for education is determined. Johns states the goal of his proposal as follows:

> The purpose of this incentive grant is to give additional state financial help to those districts that are willing to help themselves financially. (20, p. 9)

Districts would receive additional state aid money if the ratio of their local effort to local requirement exceeded a state average ratio of effort to requirement, whereas districts whose ratio fell below the average would lose a portion of the state aid money. Thus, both the goal and the results (the conditions for which the reward would be paid) are in terms of funding and clearly in the input domain. The measurement method is essentially administrative and involves the computation of the appropriate

indicies and ratios from data which would be supplied by the districts in routine reports. Johns addresses the changes required in the Florida laws governing the state foundation aid program but does not deal with the question of how districts may go about altering the amount of local support. It may be assumed, however, that the procedures are those that determine how local school taxes are levied and are political in nature.

Incentive programs with individuals as targets may have goals/results in the input domain. Programs which deal with teacher preparation, including continuing professional growth, may be of this type. Chaplin (5) reports a program in the Hartford, Wisc. Union High School District, which has as its goal the continuing professional growth of teachers and where professional growth is essentially synonymous with additional academic preparation. The plan involves a preparation/longevity salary schedule which has seven levels of academic preparation, from BA to MA + 18 units, and for each level an allowance for longevity from 1 annual increment at the BA level to 10 annual increments at the MA + 18 level. This program has both its goal and its results in the input domain. The measurement method of this program is practically self-administering and clearly involves no more than evidence of successful completion of academic course work, as well as records for longevity. The procedure is also quite clear - one merely enrolls in and passes academic course work.

3. Process Domain

Although they are generally less common, incentive programs whose goals/results are in the process domain of the educational system may also be found. Lipe, Weisgerber, and Fox (24) report a project to develop and validate a package to communicate the use of incentives to

elementary and middle school teachers and administrators. Stucker and Hall (39) describe a performance contract in which the Institute for Development of Education Activities undertook to teach individualized instructional techniques to teachers. The former, however, was not developed as an incentive program, and in the latter the incentives were to be paid to the contractor rather than the teachers. Both programs, however, clearly deal with the process domain of the educational system. An example of a program which has goals/results in both the input and process domains is taken from Rhodes and Kaplan. (32) The goal of the program is, as Rhodes and Kaplan quote from the district handbook, to "recognize the quality of teacher performance as well as the quality of teacher training and experience." That portion of the goal dealing with training and experience is the input domain, and the portion dealing with performance is the process domain. This program uses three similarly-structured preparation/longevity salary schedules. Each schedule provides for the same levels of preparation and increments of experience. The differences, however, are the amount of pay for corresponding steps and the amount of the annual salary increment. Teachers may, with the specified years of experience, be considered for promotion to the higher schedules. Promotion as well as retention on the higher schedules is determined by three factors: (1) a valid certificate, (2) professional growth (6 hours of graduate work), and (3) an appropriate evaluation rating. The certificate and professional growth requirements are in the input domain. The measurement for evaluation is basically an observational method.

Evaluation is done by the administrative and supervisory staff for all teachers as they become eligible and every 2 years thereafter. Written evaluation forms are used and reviewed with the teachers, who have the right of appeal.

Teachers are evaluated on five factors: (1) personal fitness for teaching, (2) classroom effectiveness, (3) relationship with students, (4) relationship with parents, and (5) relationship with staff. Each factor is rated on a five-point scale: (1) outstanding, (2) excellent, (3) above satisfactory, (4) satisfactory, and (5) needs improvement. Evaluation is done in accordance with a written guide, with most weight given to classroom effectiveness.

It is expected that teachers on the Basic Schedule will generally receive ratings of satisfactory. Teachers on the Career Schedule must have ratings of above satisfactory to excellent. Finally, teachers on the Master Schedule must have ratings of excellent to outstanding.

An example of a program with a goal in the process domain but targeted at an organizational entity is the Title I program of the Elementary and Secondary Act, Part B of which provides for special incentive grants. The goal of the program and the use of the incentive funds are quite clear.

Sec. 101 of the act states (in part):

> ...The Congress hereby declares it to be the policy of the United States to provide financial assistance (to local educational agencies) * to expand and improve their educational program ... to meeting the special educational needs of educationally deprived children. (9)

This is clearly a case where the objective is to affect the process domain. The special incentive grants are not, however, awarded

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* words in brackets paraphrase provisions of the act

on the basis of improvement in education of the disadvantaged. The procedure that is followed instead includes the determination of individual state indices and a national index of effort. The indices of effort are ratios (expressed in per cents) of expenditures of all non-Federal money spent on public elementary and secondary education to total personal income. Those states whose indices exceed the national index are entitled to a special incentive grant.

Although the special incentive grants are given to support compensatory education, the basis of reward is total educational expenditures. This has been criticized, for example, by Wilensky (46) as an inappropriate use of incentives to promote compensatory education and also on the basis that individual districts can do little to contribute to the state index.

More importantly for the purpose of this paper is the fact that, while the goal is in the process domain, the results (funding) and measurement (computation of indices) are in the input domain.

C. Reward

This section discusses the third of the three key aspects of incentive programs - namely, the reward. Three aspects of reward warrant discussion: (1) the nature of the reward, (2) the timing of the reward, and (3) the mechanism of delivery.

1. Nature of Reward

All of the examples of incentive programs given in this paper used monetary rewards, and in the case of school personnel, primarily salary or bonuses. While it may be the case that for programs in which an organizational entity is the target only monetary rewards are workable, it has been noted (Jung, Wolfe, and Lipe (21) among others) that other material

rewards, as well as social rewards (e.g., praise), have been used. In a study concerned with professional growth of teachers, Cory (8) found that teachers considered incentives other than salary useful. These additional incentives included among other things: (1) payment of expenses and paid leave to attend conferences, (2) fair and objective evaluation, (3) teacher participation in formulating educational policies, and (4) valid opportunities to work on curriculum revision.

This notion of rewards other than those of salary or of a monetary nature touches on some work reported by Fuller and Miskal (13), who examined a recent industrial theory of work incentives in the context of an educational organization. This work is discussed more fully in Section IV D below. The point here is that rewards in incentive programs may need to be or should be other than monetary and may require that incentive programs be described on the basis of the nature of the reward, as well as on (all or some of) the dimensions suggested above.

2. The Timing of the Reward

A major variable in incentive learning studies is the temporal relationship between the occurrence of desired behavior and receipt of reward. Jung, Lipe, and Wolfe (21, p. 56-59) identified two major models in use with students. One of these was termed the "microincentive" model, the other the "macroincentive" model. The former was characterized by incentives dependent on small increments of student performance; for example, correct responses within a lesson. Under these conditions the time lag from occurrence of desired behavior to receipt of reward is quite short. The latter (macroincentives) is characterized by incentives on very large units of student performance; for example, test gains over a school

year. Hence in this model there may (and usually does) occur a considerable lag between results and reward. Their report also notes that only the micro-incentive model has any real experimental data to support its use as a method to enhance learning.

The two most prominent studies of incentives - the OBO study (29) and the USOE study (1 and 31) both used in essence a macroincentive model.

None of the studies of incentives (excluding student incentive studies) address as an explicit variable the timing of the reward. Where efforts to combine teacher or teacher/parent incentives with student incentives are made, it would seem to be crucial to address the timing of the reward; i.e., micro- or macroincentive model.

In addition in those programs in which the teacher receives the reward (e.g., merit pay) the time lag between results and reward is characteristic of a macroincentive model.

3. Mechanism of Delivery

In discussing modes of delivery for the great variety of student incentive programs, Jung, Lipe, and Wolfe make the point that "the major objective of such (delivery) systems is to link the incentive to the desired student performance." (21, p. 24) All of the example incentive programs couple the reward with the desired behavior in order to elicit the latter. The use of explicit statements, for example, in merit pay plans defining the variables, procedures, and scoring in the evaluation process and the standards of qualification for salary increments is clearly an attempt to couple the reward to the desired behavior.

In nearly all incentive programs the reward is delivered by a superordinate position in the system (e.g., the superintendent) to subordinates in the system (e.g., teachers). Coleman makes the point that there seem to be two ways in which incentives may be provided. One is that just noted; the other is "...through a change in the structure of competition, such that rewards are not based on a superior's evaluation, but on success in a competitive structure...." (7, p. 23) Coleman also suggests that incentives resulting from a change in competitive structure are better accepted than incentives dependent on a superior's evaluation.

In this view, the notion of alternative schools, or alternative means of parental selection of schools - for example, a voucher system - is a fundamentally different way to introduce incentives.

In this context one of the criticisms of the OEO performance contracting study may be viewed in a different light. Saretsky (33) noted that there was a "John Henry" effect; that is, the teachers of the control groups knew that there was a race on, and the control groups performed atypically (better). This suggests that perhaps the competitive structure was altered by the introduction of a potential alternative - namely, performance contracting.

The changes proposed by Johns (20) are dependent on a superior's evaluation; that is, the state evaluating districts. The evaluation, however, is a competitive one; that is, an average level of performance determined by all districts is a baseline which individual districts must exceed to obtain the reward.

This question of the mechanism through which the reward is delivered or obtained may be further complicated in those cases where a strong teachers' union is involved. It is entirely possible that teachers

may perceive or the union may wish to take a posture such that the teachers would perceive, the union as basic to the mechanisms by which their incentives are obtained. In any event, it seems reasonable to believe that this issue of mechanism is an important aspect of incentive programs.

III. A CONCEPTUAL FRAMEWORK

The purpose of this section is to propose a concept for incentive programs as well as a conceptual framework to further investigate incentive programs. In addition, some of the implications of the framework will be examined.

A. The Basic Concept

The previous section examined a number of incentive programs in education. In addition, the word incentive is used by a number of social science disciplines. * It also has a common meaning or usage, generally a reward to be earned as a result of a special effort; or, something which motivates or incites one to action. Within the social sciences the word incentive, while in a few limited cases having some special technical connotations, is consistent with the common usage. Three of the social science usages warrant further discussion.

The first special usage is that by economists in the context of "tax incentives." In this use the general intent of the incentive is to promote or stimulate production or development, usually by providing a tax benefit to business organizations for meeting some special conditions: a reduction or elimination of taxes, for example, for some time period to a new or relocated company in an undeveloped area. Incentives in this context are aimed at organizational entities rather than at individuals.

The second special use is that in psychology, particularly in learning theory where the term is used to"...describe the learning process dependent upon the stimulus-response-goal sequence..." (25, p. 3), where goal is the reward/punishment. This meaning is, of course, the learning paradigm

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* Appendix A of this report contains definitions of incentive taken from a variety of sources.

used by the behaviorists and generally serves as the model for studies of incentives in the classrooms. Even in this specialized use of incentive, however, the word is sometimes used to refer to the goal (reward/punishment) itself. As implied by this definition, a negative reward, i.e., punishment, may be used. In such cases the expectation is that attempts will be made to obtain results that will reduce or eliminate the penalty. There is in this definition a coupling between the stimulus/response and the reward.

The third special use of incentive that needs to be considered is that used in contracting. In this context the term "incentive contract" means a contract that specifies a set of individually identifiable, acceptable outcomes and a range of payments, one for each outcome. Two aspects of this usage are important: first, is specification of all acceptable outcomes; that is, all of the outcomes must satisfy in some respect the general goal of the contract; and second, some outcomes are better than others and the better the outcome, the greater the reward.

In summary, all of the usages of incentive involve a reward to be given for some action on achieving some result. In some cases the reward may be offered to organizational entities rather than individuals. There is a coupling of the reward with the behavior required or the results to be obtained. Finally, the reward may have a range of values which may be associated with a range of results. Thus, defining incentive from the usage in the social science disciplines leads to the same considerations as used to examine the several examples of incentive programs in education in the previous section. Considering both the definition of incentive and its use in education, a basic concept of incentive programs may be formulated as follows:

> Incentive programs have a goal and offer a reward or set of rewards to individuals or organizations for undertaking certain actions or achieving certain results. These actions or results presumably further the goal, and there is an implicit or explicit association between the reward (s) and the result (s).

This concept may be separated into three parts for the purpose of constructing a conceptual framework. These three parts are analogous to the three characteristics used in the previous section to discuss the example programs; they are:

(1) The individuals or organizations who may receive the reward

(2) The goals/results

(3) The reward.

B. A Conceptual Framework

The conceptual framework proposed herein will hopefully serve three purposes. First, it may serve as a checklist in describing or examining an incentive program. Second, it provides a simple taxonomy for classifying such programs. Finally and most importantly, it may serve as the framework for a systematic, long-range investigation of incentives and incentive programs and their place in the organization and governance of public education in the United States.

1. Targets of Incentive Programs

The targets of incentive programs are defined as the entities that will, under the proper conditions, receive the reward. The targets of an incentive program need to be specifically identified and provide one variable for classifying a program. The first distinction to be made is whether the target is individuals or an organizational entity. Within the category of programs with individuals as targets, the program may be further

defined by the class or combination of classes of individuals who are the targets. Programs in the other major class, that is with organizational targets, may be further categorized by two considerations: (1) the level of the organizational target and (2) the nature of the change to be sought. The details of this variable of the conceptual framework are outlined below.

A. Individual Targets

1. Superintendent (School System Leader)
2. System Administrative Personnel
3. Principal (School Leader)
4. School Administrative Personnel
5. Teachers
6. Parents
7. Students

B. Organizational Targets

1. Organizational Level

a. Individual School
b. School District (LEA)
c. State

2. Nature of Change

a. Organizational (form or size)
b. Structural or Operational Change

It is conceivable that a program might have both individual and organizational targets. In this case, of course, both major categories would have to be used either to describe or classify such a program.

2. Goals/Results

The incentive program concept defined above states that the results to be obtained "presumably further the goal" of the program. The implication of this is that the goal and the results are consistent. In this context it may be well to point out that the word results is intended to convey the idea "those conditions which are to be met and for which the reward will be given." This latter idea carries with it an important implication - namely,

that there is a method of determining when conditions have been met; or, in other words, a method of measurement, and equally important that the method is agreed upon by all parties. Thomas and McKinney (43) note that one of the criteria for merit pay plans is consensus by the participants on the state-of-the-art and tools and techniques required for performance measurement. Templeton (36) states that one of the major criticisms of merit pay plans is the lack of objective standards for teacher ratings.

All incentive programs are based on the assumption that at least one procedure (method or technique) exists, which, if used, will obtain the desired results. This is so, even in those cases where the procedure is either not spelled out or is left to the choice of the targets of the program. For example, Carpenter and Hall (4) conclude that in the cases of performance contracting studies for their report, in all cases the contractors were to be paid for results and chose individualized instructional techniques as the preferred methodology. The OEO study of performance contracting left the choice of method to the contractors or, in the case of the incentive only portion of the study, to the teachers. Miller (28) has stated that this exclusion of method as an explicit variable was a serious omission in the research design.

The foregoing discussion leads to the conclusion that there are four aspects or characteristics of incentive programs which need to be considered. These characteristics are: (1) goals, (2) procedure, (3) results, and (4) measurement. Finally, in considering these characteristics of incentive programs as applied to education, the concept of education as a system with domains of inputs, processes, and outputs will be used.

This goals/results variable of the conceptual framework dealing with the characteristics of incentive programs and their relationship to the educational system may best be defined by a matrix, with one dimension the program characteristics and the other the domain of the system, as shown below:

Incentive Program Characteristic	Domain of Educational System		
	Input (i)	Process (p)	Output (o)
Goal (G)	G_i	G_p	G_o
Procedure (P)	P_i	P_p	-
Results (R)	R_i	R_p	R_o
Measurement (M)	M_i	M_p	M_o

The foregoing matrix permits clarification or extension of some of the concepts discussed above. First, it has been suggested that the goals and results ought to be consistent. It follows that the measurement must also be consistent. This may now be restated - "the goals, results, and measurement method must all be in the same domain." Second, a complete program requires that all four of the characteristics must be specified. It may be in some cases that the choice of method is to be left to the targets. Such a degree of freedom should be duly noted as an aspect of the particular program.

Finally, it should be noted that in the cell of the matrix formed by the intersection of procedure and output there is no entry. It will be recalled that procedure is the method used to bring about the desired results;

consequently, such a cell may not contain an entry as no method for output can exist. Further, if the input/process/output dimension is considered to be a sequence, then the procedure must not be later in the sequence than the goals/results/measurement entries. This implies that if one wishes to alter output, then either the inputs to the system or the processes used by the system must be altered. If the goal is to change an input, then the procedures must be from the set that is used to determine system inputs.

The Title I program described in Appendix B and cited earlier in this paper had as a goal the improvement of educational programs for the educationally deprived at the level of the school district (LEA). The incentive grants, however, were given on the basis of funding considerations to the states for subsequent distribution to the districts. This program would be thus classified as an organizational target (the LEA) with goals in the process domain but with results (conditions for reward) in the input domain and with reward distribution dependent on the mechanism of a superordinate and partially dependent on the actions of an organizational level (state applications) different from the target. As defined by this (the goals/results) variable of the conceptual framework, the Title I program would be considered to be an inconsistent program on the basis of having goals in one domain and results in another. There is also an element of inconsistency in having two levels of organizational targets, the state and the LEA's.

The USOE "Incentives in Education" project, which did not deal explicitly with the instructional methodology (procedure) to be used to improve student learning (output goal), would be defined as an incomplete program.

3. Reward

The final variable of the conceptual framework is to use the characteristic of the reward to describe or classify incentive programs. Three characteristics of reward are used to distinguish among incentive programs. These three characteristics are: (1) the nature of the reward, (2) the mechanism of delivery, and (3) the timing. Each of these primary characteristics is further subdivided.

The nature of the reward is distinguished on two dimensions. First, whether it is a monetary or some other form of reward, and second, whether the reward is given individually or on a group basis.

The mechanism of delivery uses only two subdivisions: whether the reward is determined by a superordinate in the system or whether there is a change in the competitive structure.

Finally, the timing characteristic has two subcategories. These categories follow the notion of the microincentive or macroincentive models defined by Jung, Lipe, and Wolfe. (21)

It is envisioned that this characteristic be used when a student incentive model is combined with one of the other individual target models. Current practice and research on teacher incentive programs use exclusively a macroincentive model. While it may be argued that this is the only practical approach when financial incentives are used, development of alternative reward models (see IV D below) may show that microincentive models with teachers or other personnel are possible.

The details of this variable are outlined below:

A. Nature of Reward

	Basis	
Type	Individually	Group
Money		
Other		

B. Mechanism

1. Superordinate
2. Change in competitive structure

C. Timing

1. Microincentive
2. Macroincentive

IV. CONCLUSIONS AND RECOMMENDATIONS

A. Need for a Framework

In all cases incentives generally are taken to mean the reward to be given/received as a consequence of a prespecified behavior or achieving a prespecified standard. In spite of this common (and common sense) meaning, the most striking characteristic of incentive use is the vast variety of and differences among programs which fall under the incentive rubric. This diversity (yet commonness) results in some confusion in discussing or considering incentive programs and research on incentive programs.

If one accepts the general definition of incentive, the wide variety is not only justifiable but inevitable for two reasons. First, there are a great number of places within the educational system where incentives may be applied. Second, it is not likely that economists, sociologists, and psychologists, for example, who all use incentive in their respective disciplines, will jointly agree on new and/or different words. As the various disciplines attack problems in education, it is more probable that the terms and their meanings of the different disciplines will be used in an educational context.

There is a conspicuous lack of an overall conceptual approach which provides a framework for a systematic investigation of incentives in education. Although it does not seem to have been implemented, Jung, Lipe, and Wolfe (21) did suggest a general framework for incentive programs targeted at individuals. The programs they were concerned with were generally limited to those in which student learning (output domain) was the criterion variable. As suggested in this paper, such incentive programs comprise only one category among many.

It seems clear that a framework is needed. It is strongly urged that a conceptual framework, whether it be the one suggested in this paper, a variation thereof, or a new and completely different one should be established. The framework should meet, in as far as is possible, the following general criteria:

(1) Permit the categorizing of incentive programs with a minimum of overlap and ambiguity.

(2) Provide for identification of those categories of incentive programs and facets thereof of most interest for further exploration and/or research.

(3) Provide guidance to systematic exploration of programs of utmost interest.

B. Objectives and Measurement Problem

Many, if not all, of the advocates of incentives mean the word to be applied to those cases where outcomes of the educational system (e.g., student learning) are the desiderata, and for which rewards will be made. This view is generally consistent with the position that incentives may be considered to be an aspect of accountability. More generally, however, incentives need not be applied only to outcomes of the educational system, although the behavior or state for which the reward will be given must be objectively assessable. This requirement brings the measurement problem and the related issue of goals or objectives specification into sharp focus. In particular, those incentive programs for which educational systems outcomes are the criteria are crucially dependent on resolving two issues. First, the specification of educational objectives and second, adequate or acceptable measurement instruments.

Jung, Lipe, and Wolfe (21, p. 3) raise three questions:

(1) Can educational goals be identified which are significant yet provide suitable criteria for incentives?

(2) Will major parties in the educational process allow external incentives contingent upon the attainment of such goals?

(3) Can incentives be more effective than existing programs in goal attainment?

Thomas and McKinney (43), who articulate the view that merit pay (and incentives generally) may be viewed as part of accountability, identify several criteria relative to accountability plans. (43, p. 39 & 40) These criteria include:

(1) Agreement on the objectives of the plan

(2) State-of-the-art, including participants consensus relative thereto, on the tools and techniques of the required performance measurement

(3) Willingness of the stakeholders (i.e., major parties in the educational process) to participate.

Stucker and Hall (39) state that program/product specification and objective measurement of performance are essential to performance (i.e., incentive) contracting. They review several statements of educational goals and objectives and suggest their general inadequacy for a performance contract.

Templeton states that one of the major criticisms of merit pay plans is that there are no objective standards available for teacher rating. (42, p. 2)

Stake (31) reviewed and analyzed the problems of testing in performance contracting. His analysis of the hazards and pitfalls in that context is applicable to any incentive program which depends on assessment of educational system outputs. Cohn and Millman (6) note that before one can provide incentives to schools for more or better output, a specification of that output and its measurement are necessary and propose that a start may be made.

In essence, Cohn and Millman (6), while admitting the state-of-the-art is far from satisfactory, propose an overall index measure of education output, combining several separate indicators of output. The formulation they present is the notion of a generalized educational production function in which a set of educational objectives (i.e., outputs) is a function of the interaction of a set of educational inputs (e.g., budget) with a set of non-school factors (e.g., family Socio Economic Status). They give a specific example of how such an approach might be employed using data from Kuhns. (22) While this formulation provides an approach to the problem of a generalized output measure, it is limited to secondary schools. More importantly, it does not resolve the question of agreement to objectives or adequate measurement instruments.

In summary, the specification of objectives and the demonstrated means of measuring them, both crucial to incentive programs dealing with educational system outputs, are far from satisfactory.

C. Lack of Theory

Work on incentives to date has had a minimal theoretical foundation undergirding both practice and research. Jung, Lipe, and Wolfe (21) as noted earlier distinguish between two student incentive models - the microincentive and macroincentive - and point out that the latter has almost no research history. It may be argued that the microincentive model is the behavioral psychologist's learning paradigm as applied to the school situation, and, as such, has a theoretical basis, whereas the macroincentive model does not. It is the latter model, however, which has been used in the most publicized studies of incentives in learning, including teacher incentive programs.

A macroincentive model, it will be recalled, usually involves a considerable delay between the results (occurrence of desired behavior) and receipt of reward. A merit pay plan, for example, might use observation of teacher performance as a measure in 1 year and a salary increment, in monthly installments (as a reward) in the following year. Theoretical formulations regarding incentives in learning psychology do not typically cover such extended delays between behavior and reward. Theorizing about such a model would, it seems, suggest invoking such notions as "internalized value systems" or "delayed gratification concepts." No such theoretical formulation as applied to incentive programs has yet been done.

The lack of a theoretical basis may be noted elsewhere. Stucker reviewed the major theoretical articles bearing on performance contracting and states "no general definitive statement of that theory has been found, but most of the major elements of the theory are presented." (8) Stucker then summarized the two articles he deemed most pertinent: one by Simon (30) and one by Yowell. (47) According to Stucker, Simon's work is concerned with sales contracts (contracts for results) and employment contracts (contracts

for labor resources) and the trade-offs between them. Stucker suggests Simon's discussion may be rephrased to deal with fixed or performance contracts. Stucker's review of Yowell's work makes the following points:

(1) It is a general discussion - theoretic model.

(2) It refers to only two parties, a principal and an agent.

(3) It assumes the relationship is established for the benefit of both.

(4) It focuses on the ways a principal (employer) attempts to guide the actions of an agent (employer or contractor).

(5) It examines the extent to which the principal can guide the agent by rewards conditional on the agent's results.

(6) It assumes the agent will try to maximize his results.

In this context of theory two other approaches may be mentioned. These approaches deal with the relationship of individuals to organizations. The first is March and Simon's concept of "inducements and contributions." (26) The second is Etzioni's concept of "compliance." (11) These two formulations suggest alternative ways of conceptualizing the mechanisms of reward/punishment in an organizational context.

In summary, there are several theoretical approaches which bear on the use of incentives in education. It would appear that a major issue is to rationalize these alternative theoretical formulations.

An effort to examine the various theories (some of which have been identified in this paper) that apply to the use of incentives should be undertaken. Some of the steps in such an effort should be:

(1) A mapping (that is, where and how they apply) of the various theories onto the conceptual framework should be attempted

(2) Such a mapping if at least partially successful should yield information on:

(a) Improvement of the conceptual framework

(b) Research areas where minimal or no theory is available

(c) Overlaps and gaps among the theories

(3) An attempt to extend, expand, or clarify theories to account for overlaps and gaps.

D. Boundary Problems

Some of the issues and problems of both practice and research on incentives are also problems in other areas of education. A good example of such a problem is evaluation and measurement which arises in a variety of ways in almost all areas of education. Another example is that of student incentive models, of special interest in learning studies in educational research, which may be combined with various of the individual target incentive programs.

A third example, but of a different kind, is that of "differentiated staffing." As noted earlier, Thomas and McKinney (43) consider differentiated staffing to be a variation of merit pay plans. Differentiated staffing plans, however, not only involve differential pay but also differential teacher roles. One of the proposed patterns of differential staffing is a hierarchical structure. For example, the "Clark" plan proposed for Washington, D.C. and the Temple City, California plan are of this type. Although it is true that American

public elementary and secondary schools are in general hierarchies, this concept of differentiated staffing extends the hierarchy to the point of teacher/student interaction. Although some organizational theorists have considered hierarchies in bureaucracy, little or no conceptual work regarding the place or impact of a teacher hierarchy in the educational milieu has been done. Although differentiated staffing may be studied as an incentive program, it seems equally, if not more important, for differentiated staffing to be studied from an organization factors point of view.

E. Alternative Rewards

Although student incentive studies have used a variety of rewards, those incentive programs for school personnel, both operational and experimental, have used exclusively monetary rewards. One study, Hooker and Summerfield (18), compared professional growth patterns of teachers from high incentive with teachers from low incentive districts. In this study the incentive aspects were salary schedules based on experience and academic preparation. Their results seemed to indicate that the amount of incentive had little if any effect on the number of advanced credits taken by teachers. Their findings do indicate that perhaps other more pervasive and subtle incentives, sex role expectations (e.g., males as school administrators), for example, were involved.

As noted earlier, Cory (8) identified rewards other than monetary which both teachers and principals thought valuable in providing incentives to professional growth. A paper by Fuller and Miskel (13) bears directly on this problem. They examined in an educational context a recently-developed industrial theory. This theory uses the concept of sources of work attachment;

that is, features of the work environment to which human behavior is directly related.

The idea is to find which features of work attachment are sources of satisfaction/dissatisfaction and relate incentive thereto. Fuller and Miskel used a questionnaire of 124 items (falling into 8 categories) of sources of work attachment. Each item had three responses: satisfied, indifferent, and dissatisfied. The questionnaire was administered to 508 staff members in one school district. It was found that although all teachers responded to certain work features in similar ways, three distinct groupings of teachers (satisfied, indifferent, and dissatisfied) also responded differently to other work features. Fuller and Miskel suggest that an incentive plan which provides for one set of incentives in common and three different sets of incentives for the three groups of teachers may be indicated.

In view of some of the studies which seem to indicate the questionabaility of monetary incentives to teachers, a more thorough exploration of alternative rewards seems indicated.

F. State-of-the-Art

Incentive programs in education do not meet reasonable standards of experimental studies, in the sense that Campbell and Stanley (3) define the criteria of experimental or quasi-experimental studies. The most widely publicized use of incentives - the OEO performance contracting study - has been sharply criticized by Miller (28) as having been a failure in experimentation. The USOE study "Incentives in Education" (see 1 and 31) also lacked the rigor required of an experiment. Both of these studies, for example, lacked randomization for key features of the design and in addition, focused primarily on under-achieving, disadvantaged students. Thus, although both studies report conclusions on the value of incentives, it may be the case

that these conclusions are not even generalizable to other disadvantaged students, let alone to the general public school population.

There seem to have been no experimental studies undertaken or designed to examine or permit generalization to individuals other than students. In no sense was either the OEO or the USOE study designed in such a way as to be generalized to teachers. Certainly there are a minimum of programs applying incentives to principals and administrators in the system.

Those programs focusing on organizational entities not only have not been examined in an experimental context, but there is also a lack of case studies.

Although case studies lack the rigor of experiments, they may serve to provide insight to important variables of the problem. In addition, case studies may serve as preexperimental vehicles for examining theoretical or conceptual formulations of the problem.

Considering the state of experimentation on incentives, the situation with regard to theoretical foundation for incentive programs, and the general lack of a well-documented and organized body of knowledge about incentives in education as broadly conceived as in this paper, then a group of well-done case studies may be the best starting point.

Assuming that a conceptual framework is adopted as suggested above, it would be useful to undertake a series of case studies including the use of field methods such as participant-observation and micro-enthography, for example, aimed at documenting as many of the categories of the framework as possible.

APPENDIX A

SOME DEFINITIONS OF INCENTIVE

I. COMMON USAGE

In common usage incentive is generally a special reward which encourages people to special or extra effort. The dictionary (38) defines it as:

> 1. (adj) Inciting; encouraging or moving; rousing to action; stimulative.
>
> 2. (n) That which incites or has a tendency to incite, to determination or action; motive, money and pride are incentives to action.

Synonyms include: goal, stimulus, and inducement

II. ECONOMICS

As used in economics, the meaning is consistent with the common usage except that the reward is generally monetary in nature. For example, Hanson (17) gives the following definitions:

> Incentives 1. With reference to wages, a system of wage payments which offers an inducement in the form of a bonus to encourage workers to maintain a high level of output. Opportunity of promotion is another type of incentive ...
>
> 2. With reference to the taxation of wages and profits, it means a tax system designed to encourage an expansion of output.

These definitions are consistent with others offered in dictionaries of economics; for example, Greenwald (16) and Sloan and Zurcher. (35) In the same general vein as tax incentives is the use of incentives to aid underdeveloped areas. These incentives often, although not always, include a taxation structure which favors a new (or expanded) company during its initial years. Incentives in this context are generally aimed at organizational entities, rather than individuals.

III. PSYCHOLOGY

In modern psychology incentive is generally limited to an aspect of learning having to do with a reward/punishment following a response. For example, Logan and Wagner (25, p. 3) define the concept of incentive as:

> ... The term incentive is here used to describe the learning process dependent upon the stimulus-response-goal sequence. ... Incentive is most analogous to what in everyday language might be called an expectation that reward and punishment will follow a response ... The term incentive is also widely used to refer to the reward itself especially when the reward is visible to the subject. Incentive is here reserved for the learning process dependent on reward of punishment because the important thing is for the reward to become internalized;

Psychological Abstracts lists incentive in its index with the note "see also Motivation, Reward, Reinforcement."

The word incentive is, of course, much used by the behaviorists since they use the stimulus-response-goal learning paradigm.

Industrial psychologists use incentive generally in the context of monetary reward in the sense of the economists' incentive wage systems.

IV. SOCIOLOGY

Sociologists generally follow the definition used by psychologists. Hoult (19) defines incentive under "motive (motivation)."

> In the general sense any condition of an organism promoting selective activity ... in modern behavioral psychology all determiners of behavior ... in the social sciences often used synonomously with incentive ....

V. CONTRACTING

Stucker, in writing on performance contracting in education, states (38): "Contracts that allow for a range of acceptable outcomes and specify a range of payments corresponding to these outcomes are termed performance or

incentive contracts." Stucker also cites a paper by Yowell (47) which defines incentive as:

> Incentive: A conditional reward provided only if some stated result is achieved. 'You will be rewarded with A only if you accomplish B.'

VI. EDUCATION

In education, incentive is used in ways consistent with the foregoing definitions. For example, Good (15) gives the following definition generally consistent with economists' usage.

> pay, incentive rate of (school administration) the percentage of rate above base pay that should be earned by the average employee who has been properly selected and trained for his work, when he meets a fair standard of performance.

Also in Good (15):

> incentives, the factors and forces that incite or motivate one to action.

The latter, of course, being more the common usage and generally consistent with the use in psychology.

The Education Index lists under incentives primarily incentive pay systems and provides a cross-reference to "reward and punishment." The ERIC subject index lists incentive grants and incentive systems. The former generally has to do with distribution of state aid; the latter with classroom learning, and some of these using a behavioral approach to classroom learning.

VII. SUMMARY OF DEFINITIONS

Nearly all of the definitions given above are but application of the common meaning in a special context; e.g., economics. The exception seems to be in the use by behavioral psychologists to mean the concept of stimulus-response-goal (reward/punishment), but even here incentive is often used to mean the reward (punishment).

APPENDIX B

EXAMPLES OF INCENTIVE PROGRAMS IN EDUCATION

This appendix describes several incentive programs as examples of applications in education. The appendix is organized on the basis of the conceptual framework proposed and discussed in Section III. The first division is made on the basis of whether the program has an individual or organizational target. Programs having organizational targets are further subdivided on the basis of the nature of the change sought - either a change to organization or a change to operation of structure.

Programs having individual targets are organized by the portion of the educational system domain (input, process, output) which contains the program goal.

Each program is described in terms of the goal, the procedure, the measurement, and the reward, and finally described briefly in accordance with the conceptual framework.

I. ORGANIZATIONAL TARGETS

A. Organizational Change

During the last half century one of the prime movements in American public education has been the movement toward more and larger comprehensively-organized school districts; that is, districts which offer K-12 or 1-12 grades under a central administration. The first example presented in this section is of the current California statewide program to promote the formation of comprehensively organized school districts.

Cohn and Millman (6, p. 88) state: "considerable evidence demonstrating the existence of substantial scale economies in public (especially secondary) schools has been presented in recent years..." and

go on to suggest that changes in size of schools (school districts) ought to affect economies of scale, i.e., per pupil cost relative to size. The second example is of a program proposed by Cohn and Millman to modify school organization to affect economies of scale.

1. California Incentive Program for Unified School Districts

In the State of California, comprehensive districts are called unified school districts. The California Education Code of 1959, as amended through 1972, encourages the formation of unified school districts throughout the state and specifies: (1) certain procedures to be followed, (2) a means of assessing conformance, and (3) a monetary reward.

a. Goal. The California Education Code (45) in Division 5, Chapter 10, Article 1, Section 3100 states (in part):

> Legislative intent -
>
> It is the intent and purpose ... this division be utilized primarily for the formation of unified school districts and that this form of organization be ultimately adopted throughout the state.

Section 3131.5 provides further evidence of the goal as it includes the following:

> In order to establish a system of unified districts throughout the state, (appropriately approved plans) * shall supersede any organization or reorganization accomplished under other provisions of this code.

b. Procedure. Division 5, Chapters 1-10, Articles 1601-3587 of the California Education Code (45) deals with organization and

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* Words in brackets paraphrase provisions of the section.

reorganization of school districts and establishes the procedures to be followed. The procedures for forming unified school districts include:

(1) The establishment of county committees

(2) The development of county-wide or in some cases multi-county plans

(3) Voter approval of such plans

(4) Voter approval within the affected districts of each new proposed unified district

(5) Submission of plans to and approval or disapproval thereof by the State Board of Education

(6) Provisions for plans to be made at the state level if the local areas do not do so.

c. Measurement. The various aspects of the unification process are administered by the State Superintendent of Public Instruction (Chapter 9, Section 3001) in accordance with rules and regulations of the State Board of Education (Chapter 9, Section 3002). Criteria for the formation of unified districts are established by Section 3100 and include among other provisions:

(1) Adequate enrollment

(2) Adequate financially

(3) Substantial community identity

(4) Does not promote racial or ethnic discrimination.

d. Reward. Division 14, Chapter 2, Article 2.1, Sections 17671 and 17677 provides for additional state aid for those districts in conformance with the provisions of Division 5, Chapters 9 and 10 as determined by the State Board and certified by the Superintendent of Public Instruction. Under these articles each district must have an average daily attendance (ADA) of not less than 2,000. The additional aid is $20.00/ADA. The 1969 amendments to the code provide for a foundation program of $755/ADA for elementary school pupils and $950/ADA for secondary pupils. The incentive aid is about 2.6 percent for elementary pupils and 2.1 percent for secondary pupils. Since plans for unified districts may be made at the state level if the local areas fail to do so, there is also a punishment; i.e., loss of local control.

e. Conceptual Framework Discussion. This program is targeted at an organizational entity - the school district - and seeking a change in organization form. The goals, procedures, results, and measurements are all in the input domain. Finally, a monetary reward, paid individually on the basis of a superordinate mechanism, is used.

2. Proposed Economics of Scale

As noted earlier, Cohn and Millman (6) suggest that proper size of school districts may result in economies of scale. In discussing this issue they note that "... most of the studies indicate a

U-shaped relationship between per pupil cost and school size, measured by enrollment. It follows that most schools are either too large or too small .... (p. 89) Their report goes on to note, however, that there is some indication that U-shaped relationships may not be accurate, and that it is possible that costs might decrease indefinitely as school size increase. (p. 91) Nevertheless, they assume the U-shaped relationship in proposing a program of promoting economies of scale.

a. Goal. The objective would be to promote school organization to obtain optimal-sized school districts. Cohn and Millman state "an explicit incentive structure in the state aid process would not only provide a certain degree of stimulus to change school organization but would also serve to focus attention on the scale issue." (6, p. 88/89)

Three options are proposed: (1) A penalty factor, (2) An incentive payment for schools which take action to improve their cost posture, and (3) A combination of penalty and incentive. For purposes of example, only the first option (penalty factor) will be considered.

b. Procedure. The procedure involves the assumption that there is a determinable optimal-sized school district. A study by Cohn is cited in which he found that a school of 1,653 (pupils in ADA) was the optimal size relative to per pupil cost. In essence, schools both larger and smaller than optimum would have greater per pupil costs.

The procedure involves determining a penalty factor - PF - which is based upon:

(1) The unit cost (C_m) for the optimal sized school district

(2) The adjusted unit cost (C_i) for each school district

(3) A scale factor (p) between 0-1 determined by the state legislature

such that:

$PF = p\ (C_i - C_m)$ would be the penalty factor for the ith school district. Obviously, the larger the p, the larger the PF. The unit costs could consider a variety of factors such as:

(1) Average number of hours college semester hours per teaching assignment

(2) Class size

(3) Building value per ADA

(4) Number of credit units offered

(5) Median high school teacher salary

(6) Bonded indebtedness per ADA

(7) Average number of different subject matter assignments per high school teacher.

c. Measurement. The measurement would be straightforward, based upon school district reports containing the data necessary to compute the various costs and establish the cost of the optimum-

sized school. These data would also include school size - pupil enrollment in ADA.

d. Reward. In this case the reward is to be obtained by moving toward optimum size and reducing the penalty to be incurred. In operation, the penalty factor (PF) is used to reduce state aid by multiplying the PF by enrollment - pupils in ADA (E) and subtracting the result from the state aid (A_i) for the district:

$A_{adj} = A_i - (PF.E)$ is the adjusted state aid for the ith district.

Thus, if state aid were given on an ADA basis, say $600/ADA and the PF for a specific district were say $30.00/ADA, the district would receive only $570/ADA or be penalized 5 percent of its aid monies.

e. Conceptual Framework Discussion. Although this program is targeted at an organizational entity, the precise target is not clear. The target is limited to the secondary level, but whether it is individual schools or districts is not clear. The program is seeking a change in organization, specifically in size. The goals, procedures, results, and measurements are all in the input domain. The reward is monetary, paid individually, through a change in competitive structure but involving a superordinate mechanism.

B. Structural or Operational Change

Two examples of incentive programs to modify operation of public education are given. The first example was a proposal to modify the method of distributing state aid based upon considering the relationship between school districts effort required to support a minimum education program and its actual efforts. The second example deals with an effort to modify the emphasis which schools place upon education of certain educationally disadvantaged students.

1. Ratio of actual effort/minimum effort as a mechanism to distribute state aid

Johns (20) proposed to modify the Florida State Aid Program, a foundation program, by providing a portion of state monies by comparing the ratio of local (district) actual effort to support education in relation to the local effort required for a minimum program with state average ratio of actual effort to minimum effort. This proposal to affect distribution of state aid monies differs from the Cohn and Millman proposal. The latter were directly concerned with affecting organization, whereas here the concern is with structure; that is, the mechanism or operation of local (district) support of education.

Johns makes clear that an incentive program such as he proposes must be developed in the context of a particular state and its aid program. The example which follows is taken directly from Johns' incentive program development for the State of Florida.

a. Goal. The goal is based on the belief that education must now go beyond minimum requirements. Johns states:

> The original purpose of the foundation program ... was to guarantee a minimum education program ... It is now believed

> that the state (must provide) financial incentives for school districts to provide more than a minimum program ...." (20, p. 4)

The goal is then stated succinctly:

> The purpose of this incentive grant is to give additional state financial help to those districts that are willing to help themselves financially. (20, p. 9)

b. Procedure. The procedure involves having the legislature establish state aid in two categories: (1) a foundation grant to be in accordance with existing laws and (2) an incentive grant to be given to those which exert an effort beyond that required for the minimum foundation program. The procedure also requires obtaining appropriate data from the districts and computing appropriate ratios.

c. Measurement. The measurement is basically a mechanical process depending on data supplied by the districts. The computations involve:

(1) Determining for each district the minimum tax effort required to support the Minimum Foundation Program (T_m)

(2) Determining local (district) tax effort (T_d)

(3) Computing the local ratio $R_d = \frac{T_d}{T_m}$

(4) Computing the state average ratio $\overline{R}_s = \frac{\sum_{i=1}^{n} R_d}{n}$

(5) Computing district multiplyer = $D_m = \frac{R_d}{\overline{R}_s}$

if $D_m \geq 1.0$ district is average or above in effort.

d. Reward. The actual reward would depend on the amount established by the state. The computations are comparatively simple.

(1) Compute the base amount of the incentive grant (G_b), in Florida the number of instructional units (I_u) in the Minimum Foundation Program multipled by the incentive aid (A_I) per I_u $\quad G_b = I_u A_I$

(2) Compute the actual incentive grant (G_I) by multiplying the G_b by the D_m $\quad G_I = G_b D_m$

Johns establishes limits on both $\bar{R}_s$ and D_m; in the latter case, an upper bound ($D_m \leq 1.100$) means that local effort up to but not beyond 10 percent of the state average would be rewarded.

Johns make a series of assumptions including that A_I = \$600 and that foundation aid per I_u = \$400 and computes an example if the 1965-66 funds were distributed in accordance with his proposal. The data below are taken from his Tables 2 and 3. These data show: in Col. 1 three districts - the one with highest D_m, the one closest to the state average, and the one with the lowest D_m; in Col. 2 the respective D_m; in Col. 3 the incentive grant; in Col. 4 the amount of minimum foundation program grant; in Col. 5 the total grant; and in Col. 6 the grant which would have been given to the district if

all funds were distributed as foundation grants.

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6
District	D_m	G_I	G_f	Total	If all aid were G_f
H	1.452	76,560	46,400	122,960	116,000
M	.997	369,688	247,200	616,888	618,000
L	.262	5,502	14,000	19,502	35,000

Because of the upper bound ($D_m \leq 1.100$) and no lower bound, the program appears to have more of a penalty characteristic than a reward characteristic.

e. Conceptual Framework Discussion. This program has the school district as the organizational target. The nature of the change that is sought is in structural mechanisms through which the local support for education is determined. The goal, procedure, results, and measurement are all in the input domain. A monetary reward, paid individually, through a change in competitive structure but involving the mechanism of a superordinate, is used.

2. Meeting the needs of educationally deprived children

a. Goal. Title I of the Elementary and Secondary Education Act of 1965 provided Federal assistance to local education agencies to improve educational programs for children of low-income families. Section 101 of the act states (in part): "... The Congress hereby declares it to be the policy of the United States to provide financial assistance ... to expand and improve their educational program ... to

meeting the special educational needs of educationally deprived children." (9)

In 1970 Part B, providing for special incentive grants to be awarded, became effective. (30) The purpose for which money provided under special incentive grants was to be used is clear. (Section 122 of Part B states (in part): "(2) (funds granted) used ... to meet the special educational needs of educationally deprived children." (9)

b. Procedure. The procedure includes the determination of individual state indices and a national index of effort. The indices of effort are ratios (expressed in percents) of expenditures of all non-Federal money spent on public elementary and secondary education to total personal income. For the individual states the calculations are done on state expenditures and personal income within the state; the national index on the totals of all states. Those states whose indices exceed the national index are entitled to a special incentive grant.

The states, however, are required to make application for the special incentive grants and to include appropriate assurances that the funds received will be made available to local educational agencies and will be used to meet the educational needs of educationally-deprived children.

c. Measurement. Little or no assessment is required - the basic measures being the computation of the effort indices and the determination of the number of qualified children, which is determined in any event for the purpose of the basic grants to local educational agencies.

d. Reward. Those states whose effort indices exceed the national effort index are entitled to receive a special incentive grant. The amount is dependent upon the extent to which the state index exceeds the national index and the number of low-income children in the state. A state may receive $1.00 per child for each .01 percent by which the state index exceeds the national index.

Note that although the special incentive grants are given to support compensatory education, the basis of reward is total educational expenditures. This has been criticized, for example, by Wilensky (40) as an inappropriate use of incentives to promote compensatory education and also on the basis that individual districts can do little to contribute to the state index.

e. Conceptual Framework Discussion. This program is targeted at the local educational agency (i. e., school district) but involves the state as an intermediary. The goal is in the process domain, but the results and measurement are in the input domain.

The monetary reward is paid on a group basis (to the state for subsequent distribution) through a competitive structure, but involving the actions of a superordinate. On the basis of the disparity of the goals and results, this must be considered to be an inconsistent program.

II. INDIVIDUAL TARGETS

The incentive programs which have received the most attention are those which have been directed toward the personnel in the educational system. These programs have included special contracts to test incentives only as well as attempts to introduce merit pay systems. Programs in the latter category have raised considerable controversy because they have emphasized achievement, usually academic, by the students as a basis of the reward. Using the input/process/output matrix, however, it may be argued that a salary schedule in the more traditional vein based on both preparation and longevity is also an incentive program. In this section examples of incentive programs for school personnel are given.

A. Input Domain

A case reported by Chaplin (5) is used here as the first example of incentive programs for school personnel.

1. Goal

The basic goal is to promote continuing professional growth where professional growth is, for the purposes of the plan, synonymous with additional academic preparation up to the MA + 18 units.

In addition, a special aspect of the program (Project LEAP - Leadership in Education Advancement Program) provides for rewards beyond the last academic preparation step (MA + 18). The decision to take and complete additional academic work is entirely at the discretion of the individual teachers.

The salary schedule has two dimensions: (1) seven steps of academic accomplishment (Step 1 - BA through

Step 7 = MA + 18) and (2) longevity with one annual increment at Step 1 and 10 annual increments at Step 7.

2. Procedure

The procedure is quite simple. For the basic schedule the teacher takes additional academic work.

For Project LEAP the teacher must complete a project which enhances the educational program of the district (Hartford, Wisc., Union High School). The projects must be approved in advance and completed satisfactorily.

3. Measurement

The academic aspects of the program are practically self-administering, with the teacher required only to present evidence of satisfactory completion of college-level course work.

. For Project LEAP the administration must approve the project in advance and must review it for satisfactory completion. Project LEAP increments are given only for those projects which, in the judgment of the Administration, enhance the educational program of the district.

4. Reward

Completion of the proper number of academic credits moves a teacher from one step (for example, BA) to the next step (for example, BA + 8 units); the differential at the first annual increment between any two adjacent steps is 5 percent. In addition, each higher step has more annual increments than the preceding steps, thus

carrying the additional incentive of more salary for more longevity. On the other hand, there is a distinct penalty (an immediate upper bound on salary) if a teacher elects not to continue with academic work.

For Project LEAP (teachers at the highest step - MA + 18) the rewards range from $200 to $400 and become a permanent part of the teacher's pay. Only one project may be carried out each year, although there is no limit on the number of projects.

5. Conceptual Framework Discussion

This program has an individual target - the teacher. The goals, procedures, results, and measurement are all in the input domain. A monetary reward is paid individually through a superordinate mechanism.

B. Process Domain

Thomas and McKinney (43) treat incentive or merit pay plans as one of several possible programs that are part of the accountability movement. They point out that:

> The incentive pay plans advocated today seek to replace or supplement a salary schedule based on education and longevity with a plan that provides rewards to teachers commensurate with performance. (43, p. 40)

The usual incentive is a salary differential generally awarded for superior performance in the standard teacher role. In this context superior performance is intended to be determined by measures of student achievement or perhaps classroom observation. The most important variation according to Thomas and McKinney is differentiated staffing.

Differentiated staffing generally provides not only for differential roles for teachers but also for differential pay according to the role. (48) Within any one role, however, there is usually not a differential pay based on student achievement, which is, as noted above, supposed to be a prime factor of merit pay plans. Rhodes and Kaplan (32) include descriptions of 11 merit pay plans, none of which seems to have as a feature the measurement of student achievement as a prime or even partial indicator for determining reward.

The following example, taken from Rhodes and Kaplan (32, p. 72-75) although using differentiated titles does not apparently provide for differentiated roles and is more correctly termed a "merit-plan."

1. Goal

   This plan provides for teachers to be placed on three schedules: (1) basic, (2) career placement, and (3) master placement. The purpose of using varying schedules is as Rhodes and Kaplan quote from the school district handbook to "recognize the quality of teacher training and experience."

2. Procedure

   Each of the three schedules provides for academic preparation (BA, MA, or equivalent, and MA + 30) and for up to 15 years' experience. The Basic Schedule is for new (probationary) teachers and tenure teachers who are evaluated as satisfactory. The Career Placement Schedule is for probationary teachers with at least 4 years' experience (2 in the district) and for tenure

teachers. Transfer from the basic to the Career Placement Schedule also requires a valid teaching certificate, professional growth evidenced by at least 6 hours' (or equivalent) of graduate work, and evaluation rating of at least above satisfactory.

The Master Placement Schedule is for tenure teachers or probationary with 5 years of experience (2 in the district). Also required are: (1) an MA and valid certificate, (2) professional growth, and (3) evaluation of outstanding.

Note that although BA is shown on three schedules, the requirements as stated above require an MA for the Master Placement Schedule.

Evaluation is done by the administrative and supervisory staff for all teachers as they become eligible and each 2 years thereafter. Written evaluation forms are used and reviewed with the teachers, who have the right of appeal. Final decision as to schedule placement rests with the Board of Education.

3. Measurement

Teachers are evaluated on five factors: (1) personal fitness for teaching, (2) classroom effectiveness (the major criterion), (3) relationship with students, (4) relationship with parents, and (5) relationship with staff. Each factor is rated on a five-point scale: (1) outstanding, (2) excellent, (3) above satisfactory,

(4) satisfactory, (5) needs improvement. Evaluation is done in accordance with a written guide.

4. Reward

Teachers who are placed on the Career Placement Schedule receive an initial increment of $600 and subsequent annual increments of $350, assuming they maintain an above satisfactory-to-excellent evaluation rating. Placement on the Career Schedule may occur at the fifth year. At that point the annual increment on the Basic Schedule is $300; hence placement on career schedule carries twice the annual increment. Additionally, from the sixth year on the basic schedule has annual increments of $250 compared to the $350 annual increment for the Career Placement Schedule.

. Placement on the Master Schedule carries an initial increment of $800 and subsequent annual increment of $450. Placement on the Master Schedule may occur at the sixth year, at which time the Basic Schedule has only a $250 increment.

Thus, for example, three teachers each with an MA would receive the following salaries at the sixth and tenth year:

Year	Basic	Career	Master
6	8800	9200	9350
10	9800	10,600	11,150

The additional monies paid on the Career and Master Schedules are dependent on a continuing level of performance necessary to meet the requirements of the schedule. Teachers who fail to meet the eligibility requirements may receive only a partial or no increment, or may be returned to the Basic Schedule.

5. Conceptual Framework Discussion

This program, like the last one, has an individual target - the teacher. The program has goal, results, procedures, and measurements in both the input and process domains. The monetary reward is paid individually through a superordinate mechanism.

C. Output Domain

There have been many recent programs, experimental in nature, which involved the use of incentives to improve academic performance. Most of these programs had the student as the primary recipient.

Some experimental programs either focused on the teacher or included the teacher and sometimes the parent as a part of a more inclusive design.

During the school year 1971-72 the U. S. Office of Education designed and implemented a 1-year project on the use of incentives in education. In general, the experiment involved four school districts. In each district there were experimental and control schools. Two of the districts had incentives to teachers only programs and two of the districts had incentives to teachers and parents programs.

Planar Corp. (31) in its impact evaluation report generally concludes that the teacher only model did not demonstrate any differentially positive effects over the control school in improving student performance. On the other hand, the teacher/parent model did seem to have such effects. The report notes, however, that two features of the design impose severe limitations on the inferences which may be drawn from the study. (31, IV - 7 & 8) These design features are the lack of randomization in assignment of treatments to units and the small number of experimental units (i.e., only two per condition).

The description which follows is based on the Planar Corp. report (31) cited above and Blaschke's report. (1) The two models (teachers only and teacher/parent) were quite similar, hence described jointly.

1. Goal

   The goal of this project was to demonstrate the feasibility of offering incentives to improve school learning. Two models of incentive were used: one, to teachers only; the other, jointly to teachers and parents.

2. Procedure

   The procedure involved:

   (1) Four locations (medium-sized city districts), two for the teacher-only incentive model and two for the teacher-parent model

   (2) Within each district establishing experimental schools (those offering incentives) and control schools (roughly comparable to experimental schools) not offering incentives

(3) Using standardized achievement tests to measure school (academic) learning

(4) Establishing (for the academic improvement) a Basic Gain Indicator (BGI) - having an approximate Grade Equivalency (GE)

(5) Administering standardized tests at the beginning and end of the experimental period

(6) Paying an incentive bonus based on the test score gain

(7) Using other measures (for example: questionnaires, interviews, school records and observation) to assess student, teacher, and parent behavior and/or attitudes. These types of measures, although used as partial indications to evaluate the project, had no bearing on the incentive payment.

3. Measurement

For the purposes of measurement relative to incentive payment only the Metropolitan Achievement Test Batteries were used. (27, p. 2-4) Students were given a test level suitable to their reading level as determined by their school records. A pre-test was given early in the school year (within the first month of school) and a post-test later in the school year (generally in the last 4-6 weeks). See Stake (32) for a discussion of the general inadequacies of such a testing plan.

4. Reward

The incentive to be paid depended on the average (mean) improvement of the class in terms of the basic gain indicator. The payments were made as follows:

Improvement	Teachers	Parents
Less than BGI	None	None
BGI	$150	$12.50
BGI + .1 GE	300	25.00
BGI + .2 GE	450	37.50
BGI + .3 GE	600	50.00

Teachers received the amount shown regardless of which model they took part in.

5. Conceptual Framework Discussion

This program had individual targets, one portion having teachers as targets, the other portion having teachers and parents as the targets. The goals, results, and measures were all in the output domain, the procedures apparently in the process domain since the program did not deal explicitly with the question of how the improvement in student performance was to occur. The monetary reward was paid individually on the basis of a measurement method determined by a superordinate mechanism.

In another sense the overall concept of the program was directed at modifying the input domain, in terms of examining the impact on teachers of a change in monetary reward.

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